

ABSTRACT

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The present invention relates to an apparatus including a pressure layer having an ability of following up the deformation or movement of a packed bed of a solid catalyst and/or solid adsorbent which is provided on the packed bed. Specifically, the present invention relates to an apparatus in which a pressure layer having an ability of following up the deformation of the top surface of the solid catalyst packed bed is provided on the packed bed, or in which a water-permeable pressure layer having an ability of following up the deformation of the solid catalyst packed bed is provided on the packed bed. Such pressure layers are effective in sufficiently preventing the solid catalyst from moving in the packed bed. As a result, there is no problem such as the abrasion of solid catalyst mainly caused by its movement, the deterioration of the performance thereof, and an increase in pressure loss, thereby treating waste water in a stable manner for a long period of time.